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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,383	03/26/2004	Jui-Jen Wu	N1085-00208	8606

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IP DEPARTMENT
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EXAMINER

NATALINI, JEFF WILLIAM

ART UNIT PAPER NUMBER

2858

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/810,383

Applicant(s)

WU, JUI-JEN

Examiner

Jeff Natalini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 8-20 is/are rejected.
- 7) ☒ Claim(s) 5-7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/26/03</u> . | 6) <input type="checkbox"/> Other: ____. |

Drawings

1. The drawings are objected to because they contain handwritten reference numbers and pointers to certain elements, that make the numbers unclear. Please replace all the handwriting with typed lettering/numbering. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Double Patenting

2. Claim 20 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 16. When two claims in an application are duplicates or else are so close in

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content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). Claim 20, does not add any limitations to claim 16, from which it depends since the exact wording of claim 20 is already in claim 16.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 9 and 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hellums et al. (6384664) in view of Kim et al. (6346738).

In regard to claims 1 and 11, Hellums et al. discloses a method/apparatus to detect a fuse (abstract) comprising: a fuse bridge circuit in which a first arm has a fuse under detection (fig 8 arm (302,306), fuse (302)) for producing a first voltage (col 2 line 5-11) in response to a read signal (fig 8- transistor M1 (306) is activated by read signal); a second arm (fig 8 (304,306)) of the fuse bridge circuit having a reference resistor (304) for producing a second voltage in the second arm (col 2 line 5-11) in response to the read signal pulse (fig 8- transistor M2 (306) is activated by read signal); a sensing circuit for sensing the first and second voltage as status value data (col 5 line 42-54; the voltage of the two is sensed/measured/determined in order to produce a difference

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between them as one dataout is connected to both arms); a latch circuit that stores/latches the data in the sensing circuit (col 5 line 42-54); and a timing control circuit that turns off the fuse bridge after the latch circuit has been activated/independent of read signal decay (col 5 line 51-65; the NOR gate (fig 8-802) provides a timing delay (from the propagation delay that all gates have) and the logic is based on the dataout signals and does not relay on read signal decay).

Hellums et al. lacks specifically that the reference resistor is a fuse.

Kim et al. teaches a fuse option circuit that has a first fuse (F1) in one arm and a second reference fuse (F2) in another arm (abstract).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Hellums et al. to incorporate a reference fuse in the bridge circuit in order to keep a initial resistance value so the reliability of a fuse option can be improved (abstract).

In regard to claims 2, 3, and 9, Hellums et al. lacks specifically stating where the fuse under detection and the reference fuse have the same resistance prior to programming or burning the fuse under detection, and where the first and second arms have different resistances.

Kim et al. discloses wherein prior to any tampering/test of the circuit the resistances of the fuses are identical (abstract second sentence) and the first (fig 3 left arm containing N1) and second arms (fig 3 right arm containing N2) have different overall resistance values (fig 3 shows that left arm comprising N1 would have a different

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resistance values from right arm comprising N2 because N1 will have resistance from transistor NM5 as well as NM3).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Hellums et al. to have the detection fuse and reference fuses equal in resistance, and the arms different in resistance in order to have improved reliability of the fuse (abstract last sentence).

In regard to claims 4 and 13, Hellums et al. discloses wherein the timing control circuit (fig 8, both dataout signals feed into NOR gate) is in a feedback circuit with the fuse bridge (output of NOR gate turns on fuse bridge with transistors M1, M2, would be able to turn transistors on/off based on the output of the NOR gate).

In regard to claim 12, Hellums et al. discloses wherein sensitivity to the differential voltage is adjusted (col 5 line 37-41).

In regard to claim 14, Hellums et al. discloses wherein the status value data is kept in the circuit (status value is kept in the circuit through the NOR gate which uses the status values as inputs (fig 8 (802)) which senses the differential voltage (col 5 line 56-64).

In regard to claim 15, Hellums et al. discloses wherein the switching of the bridge is turned to a non-output (off) state after latching the data (col 2 line 24-28).

In regard to claims 16 and 20, Hellums et al. discloses delaying turn off of the differential voltage by a timing circuit (fig 8, NOR gate provides delay (propagation delay) to turn off transistors M1, M2) and switching the bridge circuit to a nonoutput state after latching the data (col 2 line 24-28).

In regard to claim 17, Hellums et al. discloses wherein sensitivity to the differential voltage is adjusted (col 5 line 37-41).

In regard to claim 18, Hellums et al. discloses wherein the timing control circuit (fig 8, both dataout signals feed into NOR gate) is in a feedback circuit with the fuse bridge (output of NOR gate turns on fuse bridge with transistors M1, M2, would be able to turn transistors on/off based on the output of the NOR gate).

In regard to claim 19, Hellums et al. discloses wherein the status value data is kept in the circuit (status value is kept in the circuit through the NOR gate which uses the status values as inputs (fig 8 (802)) which senses the differential voltage (col 5 line 56-64).

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hellums et al. (6384664) in view of Beasom (4210875).

Hellums et al. lacks stating that the first and second arm have transistors with different multiples of width to gate length ratio.

Beasom discloses wherein you can adjust the gate to width ratio of one transistor in a fuse testing device for adjusting the offset voltage (col 3 line 40-46).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Hellums et al. to make the width/length of transistors in the two arms adjustable as taught by Beasom in order to be able to increase the gate to source voltage (col 3 line 42-43) of the reference arm when the fuse is blown to equate the voltages to avoid dangerous conditions.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hellums et al. (6384664) in view of Lim et al. (6498526).

Hellums et al. lacks specifically disclosing wherein the first and second arm have different resistances, and said different resistances are proportioned relative to one another to adjust sensitivity to a status of the fuse under detection.

Lim et al. discloses wherein the first and second arm have different resistances, and said different resistances are proportioned relative to one another to adjust sensitivity to a status of the fuse under detection (col 4 line 37-col 5 line 43).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Hellums et al. to have different resistances in the first and second arm and be able to adjust sensitivity to a status of the fuse under detection as taught by Lim et al. in order to verify if the fuse element has been programmed (col 5 line 7-10 and line 41-43).

Allowable Subject Matter

6. Claims 5-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 is allowable over the prior art because the timing control circuit having a first NAND gate receiving a first current pulse and a second current pulse as inputs, and a second NAND gate receiving an output of the first NAND gate and the read signal

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pulse as inputs, and an output of the second NAND gate delays turn off of the bridge circuit current until after the latch has been activated and the combination as claimed is not taught or rendered obvious by the prior art.

Claims 6-7 would be allowable because they depend from claim 5.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Denham (5789970) teaches a device for testing the state of a fuse, has two NAND gates but they are not connected together and are both used in the input part of the circuit and not as part of a timing control circuit. Fruhauf et al. (5291139) teaches an apparatus for detecting the state of a fuse, and contains on output a comparator (for comparing fuse to a reference fuse) whose output is put into an NAND gate with a control signal to control the turn on/off of the circuit. Li et al. (6819144) teaches a latched sense amplifier with a full range differential input voltage.

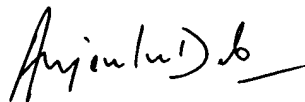
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Natalini whose telephone number is 571-272-2266. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeff Natalini



**ANJAN DEB
PRIMARY EXAMINER**